II. "The Caudal Heart of the Eel a Lymphatic Heart.—Effect of the force with which the lymph-stream is propelled therefrom on the flow of blood in the Vein into which the heart opens.—Explanation of the appearance of blood propelled in successive drops, as if from the heart, along the Caudal Vein.—Influence which the force of the lymph-stream from the heart exerts in accelerating and promoting the flow of blood in the Caudal Vein." By THOMAS WHARTON JONES, F.R.S., Professor of Ophthalmic Medicine and Surgery in University College, London, Ophthalmic Surgeon to the Hospital, &c. Received November 26, 1867.

(Abstract.)

To explain the true nature of the phenomenon of drops of blood propelled in rapid succession, *as if* from the caudal heart, along the caudal vein,—to prove thereby that the caudal heart belongs, not to the blood-vascular system, but to the lymphatic system,—and to inquire into the influence which the force of the lymph-stream from the caudal heart exerts in accelerating and promoting the flow of blood in the caudal vein, constitute the object of this paper.

The great caudal vein of the eel is formed by the junction of two trunks, a larger and a smaller. It is into the smaller trunk, near its junction with the larger, that the caudal heart opens. At the opening, there is a valve which prevents regurgitation of the lymph back from the vein into the heart.

When by the contraction of the heart the lymph is propelled into the vein, the flow of blood from that vessel into the great caudal trunk is interrupted by the force of the lymph-stream. From the place where the heart opens into the vein to the junction of the latter with the caudal trunk, colourless lymph thus replaces red blood; whilst in the caudal trunk itself, the lymph, still under the influence of the heart's force, so far displaces the blood as to flow in a colourless stream on one side of the vessel for some distance, distinct from and unmingled with the blood-stream from the lower part of the vein and its lateral branches.

During the diastole of the heart, the stream of lymph into the vein intermitting, the flow of blood from that vessel into the great trunk of the caudal vein again takes place. No sooner, however, has a small quantity of blood entered than, systole of the heart ensuing, the stream of lymph thereby propelled into the vein, drives the small quantity of blood before it into the great caudal venous trunk, whilst it at the same time arrests, as before, the flow of blood into the great caudal vein from its tributary vessel.

Through the medium of the stream of lymph propelled into the great caudal vein at each stroke of the caudal heart, an impetus is communicated to the column of blood in that vessel, which we can see has the effect of accelerating and promoting its onward flow to the blood-heart of the animal.

We thus see that the caudal heart of the eel is a lymphatic heart, its

function being to receive lymph on the one hand, and to propel it into the great vein of the tail on the other, but that, besides this function, it at the same time performs the secondary one of accelerating and promoting the flow of the blood in the great caudal vein in its course back to the blood-heart.

So far as the author has been able to ascertain, no one has hitherto given a correct explanation of the phenomenon of small drops of blood propelled in rapid succession, *as if* from the caudal heart, along the caudal vein. Without first showing that these small drops of red blood are *not* propelled *from* the caudal heart, and without showing that it is colourless lymph alone which is *really* propelled *therefrom*, no one could be warranted in dissenting from Dr. Marshall Hall, the discoverer of the caudal heart, in his opinion as to the nature of the organ, viz. that it is an auxiliary blood-heart, or in pronouncing it, how correctly soever, to be a lymphatic heart.

January 16, 1868.

Lieut.-General SABINE, President, in the Chair.

The following communication was read :—

Notices of some Parts of the Surface of the Moon, illustrated by Drawings. By JOHN PHILLIPS, M.A., D.C.L., F.R.S., F.G.S., Professor of Geology in the University of Oxford. Received January 9, 1868.

(Abstract.)

My first serious attempts to portray the aspect of the moon were made with the noblest instrument of modern times, the great telescope of Lord Rosse, in 1852. The mirror was not in adjustment, so that the axes of the incident and reflected pencils of light were inclined at a very sensible angle. This being met by a large reduction of the working area of the mirror, the performance was found to be excellent. I have never seen some parts of the moon so well as on that occasion. But when I came to represent what was seen, the difficulty of transferring from the blaze of the picture to the dimly lighted paper, on a high exposed station, with little power of arranging the drawing-apparatus, was found to be insuperable, and the effect was altogether disheartening. It was like setting down things *ex memoriâ*, to give the rude general meaning, not like an accurate and critical copy. I present as a specimen of this memorial a sketch of the great crater of Gassendi (No. 1).

I next mounted, in my garden at York, a small but fine telescope of Cooke only 2·4 inches in the aperture; and, aware of the nature of the difficulty which beset me at Birr Castle, I gave it an equatorial mounting, without, however, a clock movement. The whole was adapted to a large solid stone pillar in the open air. It was not possible, with $\frac{1}{60}$ of the light of the Rosse mirror, to *see* so well; but it was easy to represent far better what one saw, with a conveniently placed board to hold the draw-